REMARKS

[0004]   In the above referenced office action, Claims 23-29 stand rejected. Claims 23-29 are pending in the application. Claims 23 and 26 are being amended. No new matter is being added.

Rejections Under 35 USC § 102

[0005]   Claims 23-29 have been rejected under 35 USC § 102(b) as being anticipated by U.S. Patent 5,757,976 to Shu (hereinafter "Shu"). Claim 23 has been rejected under 35 USC § 102(e) as being anticipated by U.S. Patent 7,130,474 to Luo et al. (hereinafter "Luo"). For the reasons set forth below, Applicants respectfully traverses the rejections of these claims and reconsideration is hereby respectfully requested.

Cited References

[0006]   The Shu reference (Title) describes an adaptive filtering and thresholding arrangement for reducing graininess of (grayscale) images. Shu (Abstract and Summary) teaches an adaptive filtering and thresholding arrangement that provides a set of error filters having different sizes and associated weighted coefficients for diffusing quantization errors among neighboring pixels in predetermined tonal areas of a **grayscale image** to achieve a smooth **halftone image quality for printing** (emphasis added). Each error filter circuit is optimally applied to a particular pixel area depending upon the grayscale tone of that area and the desired output print resolution. The arrangement further provides for the addition of "noise" errors to threshold values at selected input image pixel ranges and at the intersection of two differently filtered areas to eliminate visible pattern distortion".

[007]   The Luo reference (Title and Background) discloses a method and system
for generating digital image files for representing a digital color image using a limited
palette of color values suitable for a limited display such as a cell phone.

Overview of the Instant Application

[0008]   The instant Application is generally related to providing tools and
techniques for achieving data compression to efficiently send and receive color video
images over a digital network while minimizing distortion caused by the data being
compressed and subsequently decompressed. As noted in the background section of
the instant Application, the Applicants recognize that "To recover the original detail once
high spatial frequency information has been discarded in favor of a higher data
compression rate, however, is impossible if the data has been discarded, i.e., if an
image is smoothed by having detail discarded and then compressed and transmitted, a
decoder at the receiving end cannot regenerate the original detail since it has been
irreversibly discarded."

[0009]   To address this issue, among others, the instant Application describes
tools and techniques for providing a reversible diffusion-based compression and an
exemplary compression engine. That is, the instant Application describes a reversible
diffusion compression technique that can be used to reconstitute a frame by
decompression without having to discard the information during the compression or
decompression. In one implementation, a reversible diffusion function is applied to
decrease high spatial frequency pixel values in an image or a prediction error image
residue and to smooth variances between adjacent pixel values. An exemplary
reversible diffusion function can increase data compression without loss of high
frequency information yet operate with online encoders and decoders that lack
significant processing power. An exemplary method transforms the data to make the
data more amenable to compression schemes that utilize entropy transforms as an

intermediate processing step, for example, prior to Huffman coding.

Anticipation Rejections

[0010]   For the reasons set forth below, Applicants submit that the cited reference
fails to provide sufficient evidence to support the findings and legal conclusion set forth
in the Office Action (OA). As stated specifically below, the Shu reference fails to provide
sufficient evidence under the § 102 standards. Accordingly, Applicants respectfully
request that the § 102 rejections be withdrawn and the application be passed to
allowance.

Independent Currently Amended Claim 23

[0011]   The OA (pages 2 and 3) asserts that Shu elements 906, 922, 920, 916,
904, 930, 960 and 936 of FIG. 9 teach or suggest each and every limitation of Claim 23.

[0012]   Applicants respectfully disagree with the OA assertion and submit that the
OA has mischaracterized the evidence in the Shu reference (particularly elements 906,
922, 920, 916, 904, 930, 960 and 936 of FIG. 9), which neither discloses or suggests
each and every limitation of Claim 23, including "**a matrix selector** for selecting
dimensions of matrices for **arranging the pixel values** to represent regions of an
image residue" (emphasis added). The OA assertion that Shu elements 922, 920, 916
of FIG. 9 is the same as the Applicant's claimed matrix selector for selecting dimensions
of matrices is misplaced. The Shu elements 922, 920, 916 of FIG. 9 explicitly depict an
input (922) of a noise circuit (920) providing an output to a threshold circuit (916), which
is not directly coupled to access or read the contents of the buffer (asserted to be
element 906 of FIG. 9). Hence, the elements 922, 920, 916 of FIG. 9 cannot be
asserted to be the same as the claimed matrix selector for selecting dimensions of
matrices for "arranging the pixel values" that are asserted to be stored in the buffer

(element 906 of FIG. 9). In addition, the OA assertion that element 904 of FIG. 9 discloses an 'image residue' is also misplaced. Shu describes tools and techniques to reduce graininess of a monochrome image. In paragraph [0030], Applicants explicitly describe the image residue as being an image of the prediction error residue. The image residue is indicative of a deviation between consecutive video frames and is clearly different than a monochrome image.

[0013]   To further clarify the claimed subject matter and to expedite prosecution, Applicants have amended Claim 23 to include a limitation 'the diffusion engine configured to apply a reverse diffusion function to restore the pixel values from the at least some of the pixel values'. Support for the above recited limitation is found in the elected species that includes FIG. 13 and paragraphs [0072] through [0078] of the instant Application. Thus, according to the instant Application, the reverse diffusion function enables smoothened images and higher data compression rates while retaining the ability to reconstruct the original pixel values. On the contrary, Shu teaches about tools and techniques for improving the monochrome image quality output to a printer but does not teach or suggest tools and techniques to deploy a reversible diffuse function to restore original pixel values.

[0014]   Therefore, under the standards of § 102, the Shu reference does not expressly or inherently teach or suggest the particular features as recited in Claim 23, including "the diffusion engine configured to apply a reverse diffusion function to restore the pixel values from the at least some of the pixel values."

[0015]   Consequently, for at least the above reasons, Applicants respectfully submit that anticipation rejection of currently amended Claim 23 is in error, since anticipation under § 102 requires that each and every element as set forth in the rejected claim is found, either expressly or inherently described, in a single prior art

reference (MPEP §2131). Accordingly, Applicants request the Examiner to withdraw
the rejection of Claim 23.

Dependent Claim 24

[0016]   The OA (page 3) asserts that Shu elements 930A, 930B, and 930C of
FIG. 9 teach or suggest each and every limitation of Claim 24.

[0017]   Applicants respectfully submit that the OA does not provide specific
references to Shu that disclose or suggest the limitations of Claim 24. Applicants have
reviewed Shu filter elements 930A, 930B, and 930C of FIG. 9 which depict a
multiplexed filter circuit to process a quantization error value and neither of which teach
nor suggest any limitation of Claim 24. Applicants request the Examiner to provide the
reference(s) that teach or suggest "an anchor value selector associated with the
diffusion engine to select one of the pixel values in a given matrix as an unchanging
diffusion boundary value for a diffusion process to be applied to pixel values in the
matrix" as recited in Claim 24.

[0018]   Consequently, for at least the above reasons, Applicants respectfully
submit that anticipation rejection of Claim 24 is not valid, since anticipation under § 102
requires that each and every element as set forth in the rejected claim is found, either
expressly or inherently described, in a single prior art reference (MPEP §2131).
Accordingly, Applicants request the Examiner to withdraw the rejection of Claim 24.

Dependent Claim 25

[0019]   The OA (page 3) asserts that Shu element 960 of FIG. 9 teaches or
suggests each and every limitation of Claim 25.

[0020]   Applicants respectfully submit that the OA does not provide specific references to Shu that disclose or suggest the limitations of Claim 25. Applicants have reviewed Shu filter element 960 of FIG. 9, which depicts an error detection and control circuit configured to determine the absolute value of the quantization error, neither of which teach nor suggest any limitation of Claim 25. Applicants request the Examiner to provide the reference(s) that teach or suggest "an entropy calculator associated with the anchor value selector to select an anchor value based on an entropy value of one or more of the pixel values" as recited in Claim 25.

[0021]   Consequently, for at least the above reasons, Applicants respectfully submit that anticipation rejection of Claim 25 is not valid, since anticipation under § 102 requires that each and every element as set forth in the rejected claim is found, either expressly or inherently described, in a single prior art reference (MPEP §2131). Accordingly, Applicants request the Examiner to withdraw the rejection of Claim 25.

Dependent Current Amended Claim 26

[0022]   The OA (page 3) asserts that Shu column 2, lines 54-67 teach or suggest each and every limitation of Claim 26.

[0023]   Applicants respectfully submit that the OA does not provide specific references to Shu that disclose or suggest the limitations of Claim 26. Applicants have reviewed Shu column 2, lines 54-67, which teaches that according to prior art a conventional error diffusion halftoning embodiment may produce "an excellent image reproduction", but it also creates well known artifacts called "worms" and "snowplowing" which degrade image quality. As such, due to the introduction of "worms" and "snowplowing" Shu cannot teach or suggest the regeneration of the original detail since the original pixel values would have been irreversibly changed or discarded. Thus, the

capability to apply "the reversible diffusion function to a matrix of pixel values" as recited in Claim 26 is not disclosed nor suggested by Shu.

[0024]   Consequently, for at least the above reasons, Applicants respectfully submit that anticipation rejection of currently amended Claim 26 is not valid, since anticipation under § 102 requires that each and every element as set forth in the rejected claim is found, either expressly or inherently described, in a single prior art reference (MPEP §2131). Accordingly, Applicants request the Examiner to withdraw the rejection of currently amended Claim 26.

Dependent Claims 27, 28, and 29

[0025]   For reasons similar to those stated above in regards to Claims 23-26 rejected under 35 USC § 102(b), dependent Claims 27-29 are allowable in their present form for at least this reason.

Independent Currently Amended Claim 23

[0026]   The OA (page 4) asserts that Luo elements 100, 260, 270, 240, 250, 140 of FIG. 1 and FIG. 3 teach or suggest each and every limitation of Claim 23.

[0027]   To further clarify the claimed subject matter and to expedite prosecution, Applicants have amended Claim 23 to include a limitation 'the diffusion engine configured to apply a reverse diffusion function to restore the pixel values from the at least some of the pixel values'. Thus, according to the instant Application, the reverse diffusion function enables smoothened images and higher data compression rates while retaining the ability to reconstruct the original pixel values. On the contrary, Luo teaches about tools and techniques for reducing size and image quality suitable for a limited display but does not teach or suggest tools and techniques to deploy a reversible

diffuse function to restore original pixel values from the reduced size and reduced
quality display.

[0028]   Therefore, under the standards of § 102, the Luo reference does not
expressly or inherently teach or suggest the particular features as recited in Claim 23,
including "the diffusion engine configured to apply a reverse diffusion function to restore
the pixel values from the at least some of the pixel values."

[0029]   Consequently, for at least the above reasons, Applicants respectfully
submit that anticipation rejection of currently amended Claim 23 is in error, since
anticipation under § 102 requires that each and every element as set forth in the
rejected claim is found, either expressly or inherently described, in a single prior art
reference (MPEP §2131). Accordingly, Applicants request the Examiner to withdraw
the rejection of Claim 23.

CONCLUSIONS

[0030]   For the foregoing reasons, the Applicants respectfully submit that the present application is now in a condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending Claims 23-29.

[0031]   Should the Examiner deem that any further action by the Applicants would be necessary for placing this application in condition for allowance, the Examiner is invited to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

Lee & Hayes, PLLC

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Dated: 5-70-08

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